This AICUZ is an evolution of the program designed to protect both the community and the ability of the installation to continue its mission. Therefore, an understanding of previous efforts is warranted.

2.1 PREVIOUS EFFORTS & STUDIES

The first NAS Miramar AICUZ study was produced by Wilsey-Ham, Inc. in 1976 and was later modified by Bolt, Beranek and Newman, Inc. The revised NAS AICUZ formed the basis of the NAS Miramar CLUP adopted in July 1977 by the Comprehensive Planning Organization, now known as the San Diego Association of Governments **(SANDAG)**. Historically, SANDAG has served as the Airport Land Use Commission **(ALUC)** for the San Diego region until the transfer to the San Diego County Regional Airport Authority in 2003. The NAS Miramar CLUP Land Use Compatibility Guidelines were adopted for proposed development within the City of San Diego in 1990. Lastly, the NAS CLUP was codified within the City of San Diego Land Development Code as a municipal ordinance known as the Miramar Airport Environs Overlay Zone. This ordinance continues to serve as an additional mechanism to ensure compatible land use planning in surrounding communities affected by Miramar operations.

Operational aircraft at Miramar have changed over the years from F-4s in the 1970s to the F-14s during the 1980/1990s. The 1992 AICUZ and CLUP reflected the aircraft fleet mix and operational tempo for NAS Miramar at that time.

2.2 CHANGES THAT WARRANT AN AICUZ UPDATE

Changes in aircraft type and operational procedures warrant an AICUZ Update

The migration of Marine Corps fixed and rotary-wing units to Miramar requires that the Miramar AICUZ be updated to refine the existing land use guidelines as adopted. Previously, there were no helicopters based at Miramar. However, the normalizing of routine operational procedures and tempo has been established. In addition, there has been a change in the Fighter aircraft assigned to Miramar from the F-14 A, A+ or D aircraft to the F/A-18 airframes assigned today. Lastly, Miramar now accommodates a refueling cargo squadron in support of the First Marine Expeditionary Force and amphibious doctrine.

CH-46 Sea Knight

KC-130 Hercules

CH-53 Super Stallion

F/A-18

There are a total of 222 aircraft on board Miramar.

2.3 CHANGES IN AIRCRAFT MIX

There are a total of 219 aircraft on board Miramar subject to deployment cycles and world events. The aircraft assigned to Miramar primarily include seven tactical and one training F/A-18 squadron(s), one C-130 refueling squadron, four CH-46 and four CH-53 helicopter squadrons and one composite squadron of various helicopters designed to meet the forward presence of Marine Corps air power globally. Table 2-1 summarizes the aircraft type and quantities that make up the current aircraft loading for MCAS Miramar.

Table 2-1 ***"Existing"*** *Aircraft Loading*

Aircraft	Squadron	Number of Squads	Squadron Type	Sub-Total	Total
F/A-18C	VMFA	3	Fighter Attack Squadrons*	36	
F/A-18D	VMFA (AW)	3	All Weather Fighter Attack Squadrons*	36	
F/A-18 A/C/D	VMFAT	1	Training Fighter Attack Squadron**	42	
F/A-18A	VMFA (MCR)	1	Reserve Fighter Attack Squadron	12	
Total Squadrons		**8**	**Total F/A-18 Aircraft**		**126**
KC-130	VMGR	1	Marine Aerial Refueler / Transport Squadron	12	
UC12B/UC35	MFD	1	Miramar Flight Division	3	
C-9	TRANSIENTS		Transient Average On-Board	3	
C-141	TRANSIENTS		Transient Average On-Board	4	
F-14	TRANSIENTS		Transient Average On-Board	4	
Total Squadrons		**2**	**Total Other Fixed Wing**		**26**
CH-46	HMM	3	Helicopter Marine Medium Lift Squadrons*	36	
CH-46	HMM (MCR)	1	Reserve Helicopter Marine Medium Lift Squadrons	12	
Total Squadrons		**4**	**Total CH-46 Aircraft**		**48**
CH-53E	HMH	4	Helicopter Heavy Lift Squadrons*	64	
Total Squadrons		**4**	**Total CH-53 Aircraft**		**64**
** Includes (3) T-34 Aircraft			**GRAND TOTAL MAXIMUM AIRCRAFT**		**264**
			DEPLOYED AIRCRAFT		**45**
			GRAND TOTAL AVERAGE ON BOARD AIRCRAFT		**219**

2.4 FLIGHT OPERATION DEFINITIONS

A flight operation refers to any takeoff or landing at MCAS Miramar. The takeoff and landing may be part of a training maneuver (or pattern) associated with the air station runway, or may be associated with a departure or arrival of an aircraft to or from a defense-related special-use airspace. Certain flight operations are conducted as patterns (e.g., Ground-Controlled Approach Box, Touch-and-Go). A pattern consists of two flight operations. Basic flight operations at MCAS Miramar are described below:

- **Departure.** An aircraft taking off to a local training area, a non-local training area, or as part of a training maneuver (i.e., touch-and-go).
- **Straight-In / Full-Stop Arrival**. An aircraft lines up 6 to 10 nautical miles from the field on the runway centerline. The aircraft descends gradually, lands, comes to a full stop, and then taxis off the runway.
- **Overhead Arrival.** An expeditious arrival using visual flight rules. An aircraft approaches the runway 500 feet above the altitude of the landing pattern. Approximately halfway down the runway, the aircraft performs a 180-degree turn to enter the landing pattern. Once established in the pattern, the aircraft lowers landing gear and flaps and performs a 180-degree descending turn to land on the runway.

- **Ground-Controlled Approach (GCA) Box.** A radar or "talk down" approach directed from the ground by Air Traffic Control personnel. Air Traffic Control personnel provide pilots with verbal course and glideslope information, allowing them to make an instrument approach during inclement weather. The GCA box actually is counted as two operations- the landing is counted as one operation and the takeoff is counted as another.
- **Touch-and-Go Operation.** An aircraft lands and takes off on a runway without coming to a full stop. After touching down, the pilot immediately goes to full power and takes off again. The touch-and-go is counted as two operations- the landing is counted as one operation and the takeoff is counted as another.
- **Field Carrier Landing Practice (FCLP).** An aircraft practices simulated carrier landing. FCLPs are required training for all pilots before landing on a carrier. The number of FCLPs performed is determined by the length of time that has elapsed since the pilot's last landing on a carrier. The FCLP is counted as two operations- the landing is counted as one operation and the take off is counted as another.
- **Low Approach.** An approach where the pilot does not make contact with the runway.

2.5 CHANGES IN OPERATIONAL TEMPO

The level of Miramar air operations can vary substantially from year to year due to deployment cycles and world events.

The level of air operations at Miramar has changed over the years, especially as the base changed it basic mission from a fixed-wing Naval Air Station to a rotary and fixed-wing Marine Corps Air Station. For example, from 1976 to the mid 1990s, the average number of annual NAS Miramar operations fluctuated between approximately 175,000 and 267,000. The adopted AICUZ for NAS Miramar was based on 257,360 fixed wing (F-14, F-16, A-4 and E-2 aircraft) operations. Table 2-2 indicates the historic Marine Corps levels of operations. Deployment cycles driven by world events continue to affect the operational tempo at Miramar.

Table 2-2 Historical Annual Aircraft Operations at MCAS Miramar

Year	MILITARY		CIVIL		TOTAL
	Navy/Marine	Other	Air Carrier	Gen. Aviation	
1996	159,600	1,192	29	6,130	166,951
1997	116,464	1,348	56	7,409	125,277
1998	80,261	834	25	7,825	88,945
1999	102,283	1,200	40	6,710	110,233
2000	84,588	987	75	5,214	90,864
2001	100,660	801	1	6,099	107,561
2002	109,655	664	37	12,005	122,361
2003	80,033	716	76	10,731	91,556

The F/A 18 and the KC-130 aircraft remain the dominant aircraft noise category for Miramar operations.

Land-use compatibility guidelines are based on the Average Annual Day **(AAD)** operations. For the existing conditions, the number of annual flight operations were provided by aircraft and operation type, and then divided by 365 days to derive the AAD operations. As indicated in Table 2-3, the fixed-wing aircraft modeled under this effort are the F/A-18 and KC-130 aircraft. These two aircraft types dominate in number of operations and in noise generation.

*Table 2-3 "**Existing and Projected**" Annual Aircraft Operations at MCAS Miramar*

Aircraft Type	Existing Condition	Projected Condition
F/A-18C/D	61,673	67,294
KC-130	7,995	9,061
UC-35	388	409
T-34	868	999
C-12	1,434	1,602
Total Fixed-Wing	**72,358**	**79,365**
CH-46	15,570	17,323
CH-53	11,341	13,351
Transient	2,203	2,203
Total Helicopter & Transient	**29,114**	**32,877**
Grand Total	**101,472**	**112,242**

The number of aircraft operations assumed under the existing Marine Corps conditions are shown on Table 2-4 for fixed-wing aircraft and Table 2-5 for rotary-wing aircraft. The existing condition is based on 2002 data.

*Table 2-4 "**Existing**" MCAS Miramar Fixed-Wing Annual Aircraft Operations*

AIRCRAFT TYPE	Mission Readiness (MR)	DEPARTURES		ARRIVALS		CLOSED PATTERNS			TOTAL
		JULIAN	SEAWOLF	SI	OVHD	GCA	TGO	FCLP	
F/A-18C/D (-400, -402)	77.9%	8,779	8,919	9,099	9,417	891	14,711	9,857	61,673
KC-130	75.0%	401	304	108	471	232	6,479	0	7,995
UC-35	94.9%	121	120	121	0	13	13	0	388
T-34	86.9%	172	172	172	172	30	150	0	868
C-12	89.5%	389	388	389	0	134	134	0	1,434
Total Fixed-Wing		**9,862**	**9,903**	**9,889**	**10,060**	**1,136**	**21,487**	**9,857**	**72,358**

Notes: (1) SI - Straight-In Arrivals; OVHD - Overhead-Break Arrivals; TGO - Touch and Go
(2) FCLP - Field Carrier Landing Practice; GCA - Ground Controlled Approach
(3) Arrivals do not equal departures due to mission schedules
(4) GCA and TGO and FCLP are counted as 2 Operations
(5) UC-35, T-34, and C-12 aircraft not modeled
Source: MCAS Miramar, 2002

*Table 2-5 **"Existing"** MCAS Miramar Rotary-Wing Annual Aircraft Operations*

Helicopter Type	Mission Readiness (MR)	Departures	SI Arrivals	Closed Patterns			Total
				TGO	FCLP	GCA	
CH-46	76.4%	3,499	3,711	8,036	-	325	15,570
CH-53	72.2%	2,462	2,660	5,953	-	266	11,341
Transient	N/A	518	630	893	-	161	2,203
Total Helos		**6,479**	**7,001**	**14,882**	**-**	**752**	**29,114**

Notes: (1) SI - Straight-In Arrivals; TGO - Touch and Go
(2) FCLP - Field Carrier Landing Practice; GCA - Ground Controlled Approach
(3) Arrivals do not equal departures due to mission schedules
(4) GCA and TGO and FCLP are counted as 2 Operations
(5) Transient helicopters not modeled
Source: CY01 ATA reports, MCAS Miramar, 2002

The number of operations for the projected MCAS Miramar condition was based on the methodology used for MCAS Miramar's 2003 Clean Air Act conformity analysis. Projected operations were determined by taking current operations and adjusting upward to reflect the highest expected flight operations using a mission readiness factor of 85%. Mission readiness is an indicator of the availability of an aircraft for flight operations, reflecting maintenance and fiscal constraints. Based on input from the 3D Marine Aircraft Wing, the projected mission readiness factor is not expected to exceed 85%. The projected operations are shown on Tables 2-6 and 2-7. Charts and tables in this document reflect the projected condition based on 85% mission readiness.

*Table 2-6 "**Projected**" MCAS Miramar Fixed-Wing Annual Operations*

Aircraft Type	Mission Readiness (MR)	Departures		Arrivals		Closed Patterns			Total
		JULIAN	SEAWOLF	SI	OVHD	GCA	TGO	FCLP	
F/A-18C/D (-400)	85.0%	4,790	4,866	4,964	5,138	486	8,026	5,378	33,647
F/A-18C/D (-402)	85.0%	4,790	4,866	4,964	5,138	486	8,026	5,378	33,647
KC-130	85.0%	454	345	122	534	263	7,343	0	9,061
UC-35	100.0%	128	126	128	0	14	14	0	409
T-34	100.0%	198	198	198	198	35	173	0	999
C-12	100.0%	435	434	435	0	150	150	0	1,602
Total Fixed-Wing		**10,794**	**10,834**	**10,811**	**11,007**	**1,433**	**23,731**	**10,755**	**79,365**

Notes: (1) SI - Straight-In Arrivals; OVHD - Overhead-Break Arrivals; TGO - Touch and Go
(2) FCLP - Field Carrier Landing Practice; GCA - Ground Controlled Approach
(3) Arrivals do not equal departures due to mission schedules
(4) GCA and TGO and FCLP are counted as two (2) Operations
(5) UC-35, T-34, and C-12 aircraft not modeled
Source: MCAS Miramar, 2002

*Table 2-7 "**Projected**" MCAS Miramar Rotary-Wing Annual Operations*

Helicopter Type	Mission Readiness (MR)	Departures	Arrivals	Closed Patterns			TOTAL
				TGO	FCLP	GCA	
CH-46	85.0%	3,892	4,128	8,941	-	361	17,323
CH-53	85.0%	2,899	3,132	7,008	-	313	13,351
Transient	N/A	518	630	893	-	161	2,203
Total Helos		**7,309**	**7,890**	**16,842**	**0**	**836**	**32,877**

Notes: (1) TGO - Touch and Go
(2) FCLP - Field Carrier Landing Practice; GCA - Ground Controlled Approach
(3) Arrivals do not equal departures due to mission schedules
(4) GCA and TGO and FCLP are counted as two (2) Operations
(5) Transient helicopters not modeled
Source: CY01 ATA reports, MCAS Miramar, 2002

2.6 CHANGES IN FLIGHT TRACKS / PROCEDURES

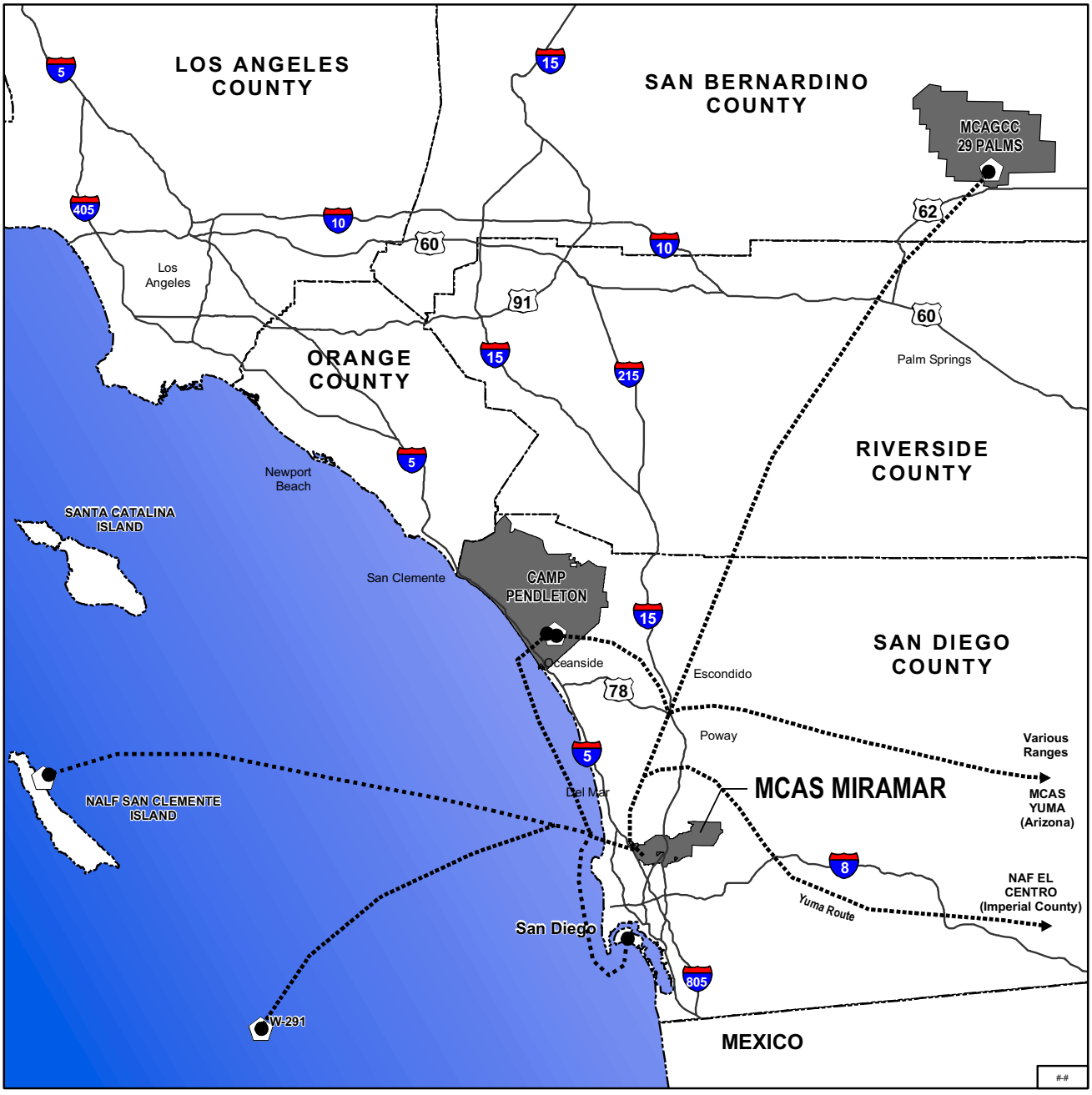
A series of routes are used as flight corridors by MCAS based and visiting aircraft. Figure 2-1: "Regional Flight Routes" indicates the general location of these regional routes. Training ranges and complexes used by MCAS Miramar based squadrons are the Whiskey (W)-291 (a warning area used for military over-water training), R-2510 (a training complex in Imperial Valley), Naval Auxiliary Landing Field (**NALF**) San Clemente Island (primarily a FCLP training field), Navy Outlying Field (**NOLF**) San Nicolas Island, Marine Corps Base (**MCB**) Camp Pendleton, MCAS Camp Pendleton, Expeditionary Air Field (**EAF**) Twentynine Palms and MCAS Yuma.

Regional Flight Routes

Figure 2-1

MCAS MIRAMAR

- **Military Airfield or Range Destination**
- **Military Installations**
- **Generalized Aviation Corridor Destination**
- **County Boundaries**



There are four main arrival and departure routes for assigned CH-46 and CH-53 helicopters.

There are four main arrival and departure routes for assigned CH-46 and CH-53 helicopters at MCAS Miramar. The Fairway Corridor transits over the Torrey Pines Municipal Golf Course. The Beach Route follows the railroad tracks and heads towards the ocean turning west just south of Del Mar, proceeding over the Los Penasquitos Lagoon to the ocean. The I-15 Corridor follows Interstate 15 for transit north to ranges at Camp Pendleton or the desert. Lastly, the Yuma Corridor heads east just south of the runways, proceeding over the Padre Dam Municipal Water District ponds (Santee Lakes) to a variety of ranges to the north and training facilities in multiple desert areas to the east. Flight operations for helicopters are primarily conducted under Visual Flight Rules **(VFR)**, subject to weather and air traffic conditions. Permitted reporting points, published altitudes and headings are utilized to reduce and/or lessen the single event noise impacts from transiting rotary-wing aircraft on a routine basis.

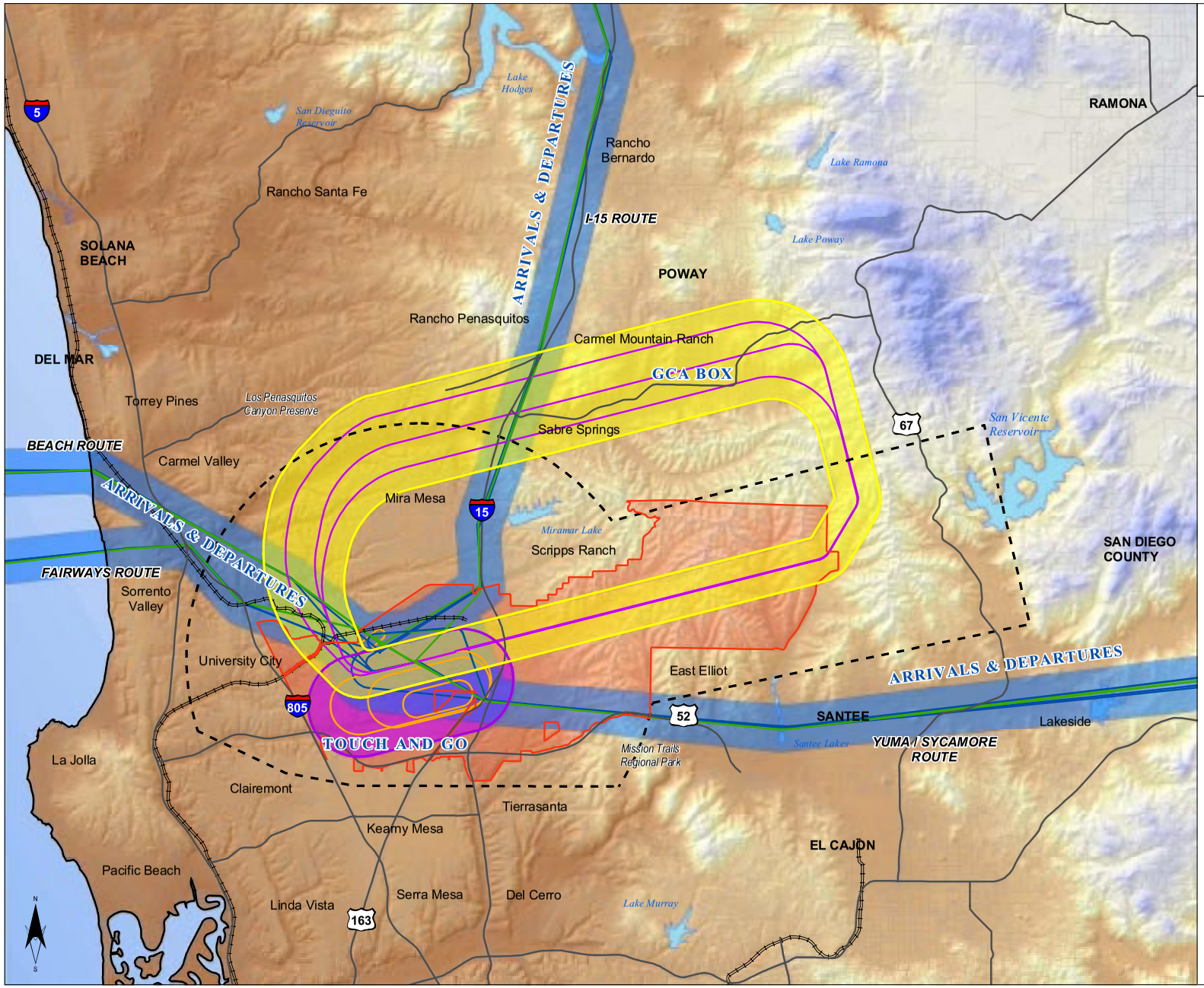
Helicopter pilots often perform T&G and GCA patterns to ensure proficiency in these areas. The primary T&G pattern is south of the runways on the LHD strip. Flight operations in these corridors are show on Figure 2-2.

Fixed-wing flight operations are conducted in the Seawolf, Julian, Field Carrier Landing Practice, T&G and GCA Box Pattern Flight Corridors. Fixed-wing flight corridors for Miramar operations are consistent with historical practices. Fixed-wing operations include the F/A-18, C-130 and C-12 aircraft and are mainly conducted under Instrument Flight Rules **(IFR)** and through specific Air Traffic Control clearance instructions with directional vectoring by the Federal Aviation Administration. Arrivals can occur from the south or the north and were designed to reduce the impacts on adjacent communities to the maximum amount practicable. Flight operations in these corridors are shown on Figure 2-3.

2.7 AICUZ STUDY AREA

The AICUZ Study Area utilizes major roadways and/or community boundaries to define its edge.

Boundaries of the AICUZ Study Area **(ASA)** are based on the existing community planning or jurisdictional boundaries of local municipalities located nearby. Figure 2-4 identifies the ASA for MCAS Miramar. The ASA has been defined to reflect those areas identified within surrounding communities affected by military aircraft operations. Community Noise Equivalent Level **(CNEL)** Noise Contours, Accident Potential Zones **(APZs)** and routine flight corridors have been included for land use planning purposes. The adopted NAS Miramar CLUP did not include the Ground Controlled Approach **(GCA)** Box Corridor (a closed loop training pattern) for land use planning purposes. The ASA includes all routine operating areas and flight corridors for fixed and rotary-wing aircraft assigned to MCAS Miramar.



MCAS MIRAMAR

Figure 2-2

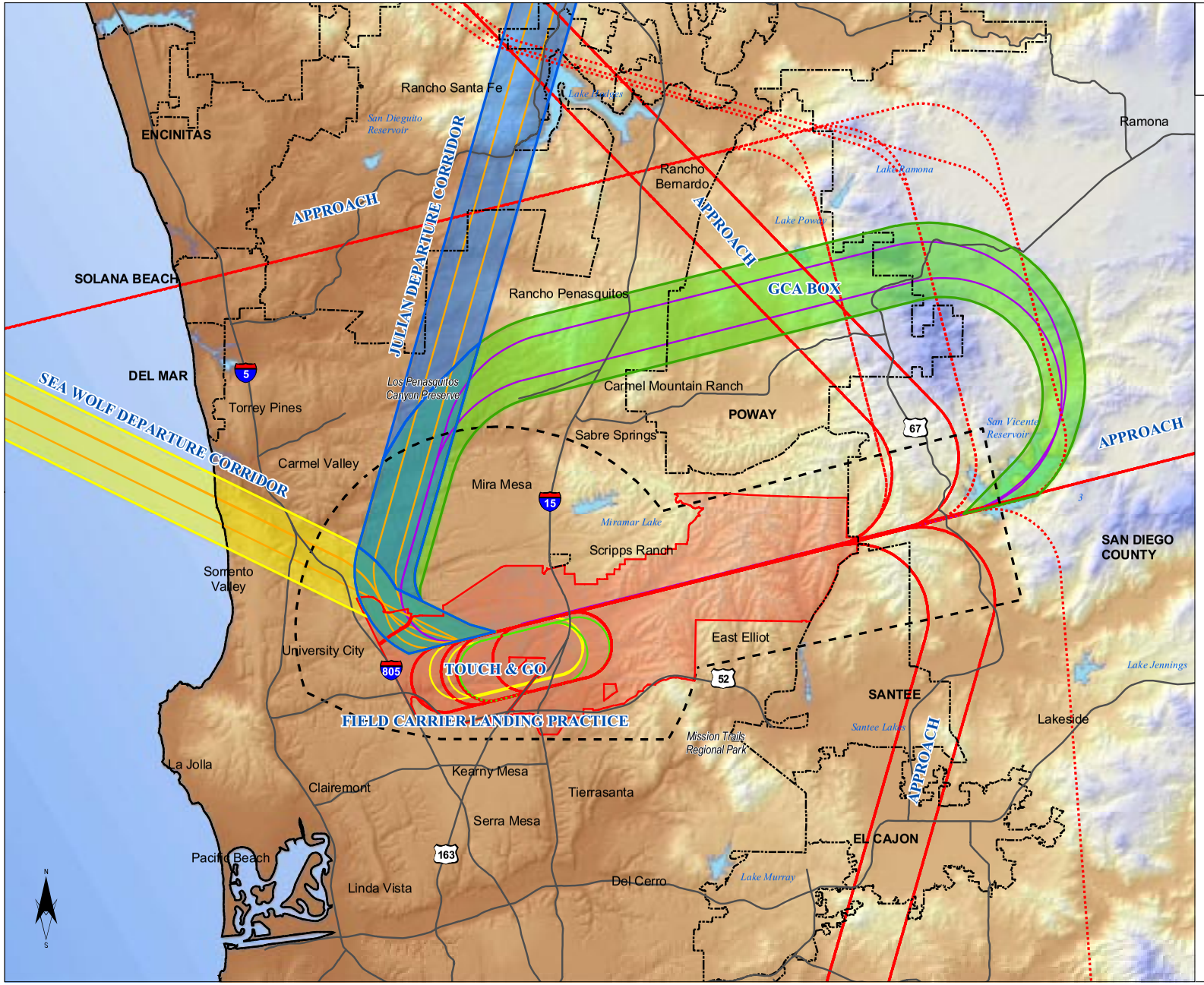
MCAS Miramar Rotary-Wing Flight Corridors

- Airport Traffic Area
- Departure & Arrival Corridors
- GCA Box Corridor
- Touch & Go Corridor
- ARRIVAL
- DEPARTURE
- GCA
- TOUCH AND GO

Note: Flight Tracks are provided in the Final Noise Survey for MCAS Miramar. This figure represents flight corridors only. Approximately 90 percent of all operations occur within these corridors.

2 0 2

Scale in Miles



MCAS MIRAMAR

Figure 2-3

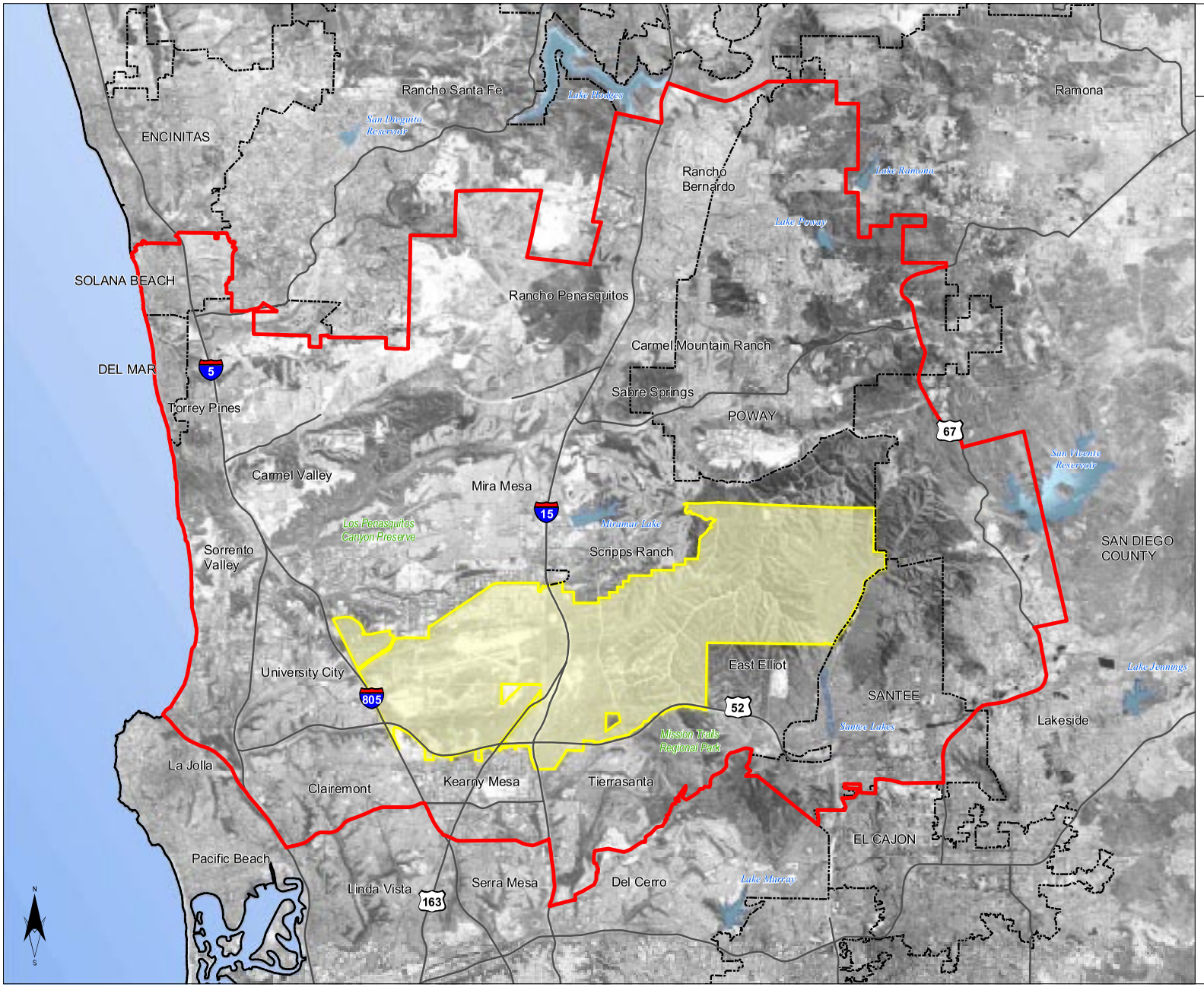
MCAS Miramar Fixed Wing Flight Corridors

- Airport Traffic Area
- Julian Corridor
- GCA Box Corridor
- Seawolf Corridor
- ARRIVAL
- DEPARTURE
- FCLP
- GCA
- TOUCH AND GO

Note: Flight Tracks are provided in the Final Noise Survey for MCAS Miramar. This figure represents flight corridors only. Approximately 90 percent of all operations occur within these corridors.

2 0 2

Scale in Miles



MCAS MIRAMAR

Figure 2-4

AICUZ Study Area

- Freeways
- City Boundary
- MCAS Miramar Boundary
- AICUZ Study Area